REMARKS/ARGUMENTS

Claims 9-16, the apparatus claims, have been elected for examination.

Claims 9, 10 and 12 have been rejected over Uehara et al. in view of Watanabe et al. and Padhi et al. Claim 11 has been rejected over the first group of references, further in view of Chau et al.

Claims 13, 14 and 16 have been rejected over Uehara et al. in view of Ueno et al. Claim 15 has been rejected over Uehara et al., Ueno et al. and Chau et al.

Claim 9 is amended herein. Claims 10-12 remain dependent from claim 9 as amended. As amended, claim 9 recites in part:

> a controller which keeps said substrate holding device on standby in the heated treating solution stored in said treating tank to preheat said substrate holding device, and when the plurality of substrates are transported by said substrate transport mechanism to said treating tank, raises said substrate holding device from said treating tank to receive the plurality of substrates from said substrate transport mechanism, and lowers said substrate holding device having received the plurality of substrates to immerse the substrates in the heated treating solution in the treating tank, thereby to treat the substrates.

Support for the amendment of claim 9 is found in the specification as published in the United States, in which paragraph [0031], states: "... The lifter 20 corresponds to the substrate holding device in this invention." Further, paragraph [0032] states: "The substrate treating method in this embodiment is characterized in that the lifter 20 is preheated by being immersed in the heated phosphoric acid solution stored in the treating tank 22 before immersing the lifter 20 holding a plurality of wafers W in the heated phosphoric acid solution (see the left end portion of Fig. 2). When a group of wafers W is transported by the substrate transport mechanism 5 to the treating tank 22, the lifter 20 is raised from the treating tank 22 and receives the wafers W from the substrate transport mechanism 5 (see the middle portion of Fig. 2). The lifter 20 having received the wafers W is lowered promptly to immerse the wafers W in the heated phosphoric acid solution in the treating tank 22, whereby the wafers W are collectively subjected to etching treatment (see the right end portion of Fig. 2)." Moreover, Fig. 2 shows that the substrate treatment is carried out in the order of: immersion of the substrate holding device, receipt by the substrate holding device of a plurality

of substrates from the substrate transport mechanism, and immersion of the substrate holding device and substrates.

The references neither disclose nor suggest "a controller which keeps said substrate holding device on standby in the heated treating solution stored in said treating tank to preheat said substrate holding device, and when the plurality of substrates are transported by said substrate transport mechanism to said treating tank, raises said substrate holding device from said treating tank to receive the plurality of substrates from said substrate transport mechanism, and lowers said substrate holding device having received the plurality of substrates to immerse the substrates in the heated treating solution in the treating tank, thereby to treat the substrates" as recited in claim 9 of the present application.

U.S. Patent No. 6,767,840 (Uehara et al.) states, "Silicon wafers were set in the wafer processing bath filled with a solution mixture of ammonia, hydrogen peroxide, and ultrapure water at about 80°C" (Column 10, lines 65-67). This suggests treating with a heated treating solution in the treating tank.

Uehara et al. further states, "In this example, a heat treatment was further performed in a hydrogen atmosphere at 1,100°C for about 1 h" (Column 14, lines 41-42). This suggests a heat treatment in an atmosphere.

In U.S. Patent No. 6,024,888 (Watanabe et al.), heater unit 71 is embedded in the leg of wafer boat 33, and the heater unit 71 is operable to heat the leg, which heats the wafer held (Column 6, lines 36-44). Watanabe et al. states, "a water adsorption layer is formed on the wafer surface 111 during etching. It was confirmed that this water adsorption layer can be effectively removed by heating the substrate with the heater element 73 after finishing the etching process" (Column 11, linens 50-54). This suggests that a wafer is heated after the etching process.

U.S. Patent No. 5,421, 905 (Ueno et al.) describes that an IR heater 52 is used to clean and dry the back plate of wafer fork 41 (which is said to correspond to the substrate holding device of the present invention).

However, these references do not have the technical concept of claim 9, i.e., "keep[ing] said substrate holding device on standby in the heated treating solution stored in said treating tank to preheat said substrate holding device, and when the plurality of substrates are transported by said

substrate transport mechanism to said treating tank, rais[ing] said substrate holding device from said treating tank to receive the plurality of substrates from said substrate transport mechanism, and lower[ing] said substrate holding device having received the plurality of substrates to immerse the substrates in the heated treating solution in the treating tank, thereby to treat the substrates".

As noted above, Uehara et al. treats with either the heated treating solution in the treating tank or with an atmosphere, rather than with a substrate holding device as in claim 9. As noted above, Uehara et al. performs a heating operation during treatment, rather than before the immersion as in the present invention.

As also noted above, although Wantanabe et al. heats the substrate holding device, as does the invention of claim 9, the time of heating is after HF gas etching, and not before an immersion as in claim 9. This is because Watanabe et al. intends to remove a water layer formed on the wafer surface by HF gas etching, and its technical concept lies in heating the wafer by heating the leg of wafer boat 33 in order to achieve the above object. On the other hand, the present invention is based on the fact that the substrates treated as a batch are subject to an inconvenience of an etching amount varying from substrate to substrate, and the technical concept of claim 9 is that the substrate holding device is preheated before the immersion treatment.

As further noted above, although Ueno et al. heats the substrate holding device as does the present invention, the timing of heating is during cleaning and drying treatment, and not before the immersion treatment as in the present invention.

The foregoing references are not supplemented by US 2003/0209523 (Padhi et al.) and US 2003/0132480 (Chau et al.). The references neither disclose nor suggest the technical concept of claim 9. Thus, references show no recognition of the subject matter of claim 9. Therefore, claims 9-12 are requested to be allowed.

Claim 13 is also amended herein. Claims 14-16 remain dependent from claim 13 as amended. As amended, claims 13 recites in part:

> a controller which controls the treatment of the substrates by immersing said substrate holding device holding the substrates in the heated treating solution stored in said treating tank;
>
> wherein said substrate holding device includes a plurality of holding rods for holding the plurality of substrates in vertical posture, and a back plate supporting said holding rods in cantilever fashion,

said back plate having a heating device; and

said controller further preheats said back plate by means of said heating device before the treatment of the substrates.

Support for the amendment of claim 13 is found in the specification as published in the United States, in which paragraph [0057] states: "(1) ...The lifter 20 may be preheated before treating a group of wafers W, ...Alternatively, the lifter 20 may be preheated by a heating device such as a heater provided therefor." Further, paragraph [0058] states: "(2) Fig. 7 shows a modification in which a heating device such as a heater [is] provided for the lifter 20 in the apparatus shown in Figs. 5 and 6. The holding rods 20a of the lifter 20 have a relatively small heat capacity, and therefore have a relatively little thermal influence on the heated phosphoric acid solution. On the other hand, the back plate 20b has a large heat capacity, and has a strong thermal influence on the phosphoric acid solution. Thus, a heater 20c is mounted in or on the back plate 20b of the lifter 20 to preheat the back plate 20b, thereby to suppress the thermal influence on the heated phosphoric acid solution. This measure also is effective to suppress variations in treatment occurring among substrates treated collectively." Moreover, Fig. 7 shows the substrate holding device having a heating device provided for the back plate.

The references neither disclose nor disclose nor suggest "a controller which controls the treatment of the substrates by immersing said substrate holding device holding the substrates in the heated treating solution stored in said treating tank; ...said controller further preheats said back plate by means of said heating device before the treatment of the substrates" as recited in claim 13 of the subject application.

As noted in relation to claim 9 above, the references cited do not recognize the subject matter of claim 13, that the substrates treated as a batch are subject to an inconvenience of an etching amount varying from substrate to substrate. The references neither disclose nor suggest the technical concept of claim 13 that the substrate holding device is preheated before the immersion treatment.

Thus, the references neither disclose nor suggest in any way the technical concept similar to that of claim 13. Therefore, claim 13 in this application is not obvious from the references cited. Claims 14-16 in this application depend from claim 13, and also are not obvious from the references.

In view of the foregoing amendments and remarks, allowance of claims 9-16 is requested.

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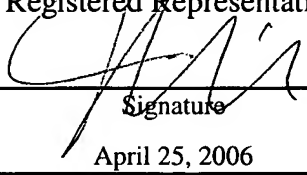
Name of applicant, assignee or Registered Representative



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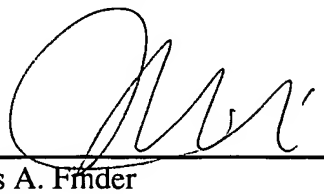
Respectfully submitted,



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